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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|---------------------|------------------|
| 10/511,729 | 10/19/2004 | Masaharu Ushihara | MEIC:177 | 2577 |
| 27890 | 7590 | 12/28/2005 | EXAMINER | |
| STEPTOE & JOHNSON LLP 1330 CONNECTICUT AVENUE, N.W. WASHINGTON, DC 20036 | | | AURORA, REENA | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 2862 | |
| DATE MAILED: 12/28/2005 | | | | |

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|-------------------------------|---------------------------------|--|
| Office Action Summary | Application No. 10/511,729 | Applicant(s) USHIHARA ET AL. | |
| | Examiner Reena Aurora | Art Unit 2862 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 November 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1, 2 and 5 - 16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 2 and 5 - 16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 October 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

This communication is in response to amendment received on 11/08/05.

Claims 1, 2 and 5 - 16 are presented for examination.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 2, 5, 8 – 12 and 15 - 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ichiro et al. (JP 2002-213910) in view of Okumura et al. (JP 2001-165609).

As to claim 1, Ichiro et al. (hereinafter Ichiro) discloses a rotation angle detector comprising a main rotator (26, fig. 7); a first detecting rotator (15) having a contact with the main rotator (26), and for rotating faster than the main rotator (the diameter of the main rotator is larger than the diameter of the first detecting rotator, therefore the first detecting rotator will rotate faster than the main rotator); a first magnet (16) located at a center of the first detecting rotator (15); a first magnetic detector (19) located adjacent a surface opposite the first magnet (16); a second detecting rotator (27) having a contact with the first detecting rotator (15), the second detecting rotator (27) for rotating differently in speed from the first detecting rotator (15) (since both first and second detecting rotators have different number of teeth and therefore they both would have a

Art Unit: 2862

rotating speed different from each other, a second magnet (14) located at a center of the second detecting rotator (27) and a second magnetic detector (18) located adjacent a surface opposite the second magnet (14). Ichiro fails to disclose a ferromagnetic body encircling one of the first or second magnets, and incorporated in and thus rotatable with one of the first or second detecting rotators. Okumura et al. (hereinafter Okumura) discloses an angle sensor wherein a ferromagnetic body (70, fig. 1 and 2) is disposed so as to encircle a magnetic detector (H2, fig. 1) as a magnetic shielding member such that it shields the magnetic detector from fields other than the field which the magnet near that sensor generates. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the device of Ichiro in view of the teachings of Okumura which teaches the concept of shielding the sensor from external magnetic field such that encircling the second magnetic detector of Ichiro with a ferromagnetic body would properly shield the second magnetic detector from the external magnetic fields other than second magnet to provide an accurate rotation angle.

As to claim 10, Ichiro discloses a rotation angle detector comprising a main rotator (26, fig. 7); a first detecting rotator (15) having a contact with the main rotator (26), and for rotating faster than the main rotator (the diameter of the main rotator is larger than the diameter of the first detecting rotator, therefore the first detecting rotator will rotate faster than the main rotator); a first magnet (16) located at a center of the first detecting rotator (15); a first magnetic detector (19) located adjacent a surface opposite the first magnet (16); a second detecting rotator (27) having a contact with the first

Art Unit: 2862

detecting rotator (15), the second detecting rotator (27) for rotating differently in speed from the first detecting rotator (15) (since both first and second detecting rotators have different number of teeth and therefore they both would have a rotating speed different from each other, a second magnet (14) located at a center of the second detecting rotator (27) and a second magnetic detector (18) located adjacent a surface opposite the second magnet (14). Ichiro fails to disclose a ferromagnetic body encircling and fixed with respect to one of the first magnetic detector and the second magnetic detector. Okumura et al. (hereinafter Okumura) discloses an angle sensor wherein a ferromagnetic body (70, fig. 1 and 2) is disposed so as to encircle and fixed with respect to a magnetic detector (H2, fig. 1) as a magnetic shielding member such that it shields the magnetic detector from fields other than the field which the magnet near that sensor generates. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the device of Ichiro in view of the teachings of Okumura which teaches the concept of shielding the sensor from external magnetic field such that encircling the second magnetic detector of Ichiro with a ferromagnetic body would properly shield the second magnetic detector from the external magnetic fields other than second magnet to provide an accurate rotation angle.

As to claims 2 and 11, Ichiro discloses that each of the first magnetic detector (15) and the second magnetic detector (27) includes an anisotropic magnetic resistance element.

As to claims 5 and 12, Ichiro fails to disclose that the second ferromagnetic body incorporated in one of the first magnetic detector or the second magnetic detector, wherein when the first ferromagnetic body is incorporated in the first detecting rotator, the second ferromagnetic body is incorporated in the second magnetic detector, and when the first ferromagnetic body is incorporated in the second detecting rotator, the second ferromagnetic body is incorporated in the second detecting rotator, the second ferromagnetic body is incorporated in the first magnetic detector. Okumura discloses an angle sensor wherein a ferromagnetic body (70, fig. 1 and 2) is incorporated in a magnetic detector (H2, fig. 1) as a magnetic shielding member such that it shields the magnetic detector from fields other than the field, which the magnet near the sensor generates. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the device of Ichiro in view of the teachings of Okumura which teaches the concept of shielding the sensor from external magnetic field such that incorporating the second magnetic detector of Ichiro with a ferromagnetic body would properly shield the second magnetic detector from the external magnetic fields other than second magnet to provide an accurate rotation angle.

As to claims 8 and 15, Ichiro discloses a calculator (20, fig. 7) for calculating a rotation angle of the main rotator (26, fig. 7) according to output from the first magnetic detector (15) and the second magnetic detector (27).

As to claims 9 and 16, Ichiro discloses that the calculator (part of detection circuit 20) (20, fig. 7) is for calculating the rotation angle of the main rotator from a phase

Art Unit: 2862

difference in outputs of the first magnetic detector (15) and the second magnetic detector (27).

Claims 6, 13 and 7, 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ichiro et al. (JP 2002-213910) in view of Okumura et al. (JP 2001-165609) as applied to claims 1 and 10 above, and further in view of Bergstedt et al. (5,602,472).

As to claims 6, 13 and 7, 14, Ichiro and Okumura do not explicitly disclose that the first ferromagnetic body comprises a ring shaped iron plate or pieces arranged in the form of a ring (as in claims 7 and 14). Bergstedt et al. (hereinafter Bergstedt) discloses a device for determining an angular position of a rotatable member including a ferromagnetic body made of a ring shaped iron plate as a shield (84, fig. 6) to optimize sensor performance. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the device of Ichiro in view of the teachings of Okumura and further in view of the teachings of Bergstedt to provide a ring shaped iron plate around the sensor or pieces arranged in the form of a ring (claims 7 and 14) to completely shield the sensor from external magnetic fields. The shape of the shield and the material of the shield is selected such that it provide optimize sensor performance in the magnetic environment of the particular application (col. 7, lines 11 – 23, Bergstedt).


Response to Arguments

Applicant's arguments with respect to claims 1, 2 and 5 - 16 have been considered but are moot in view of the new ground(s) of rejection.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Reena Aurora whose telephone number is 571-272-2263. The examiner can normally be reached on Monday - Friday, 7:00 - 3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, E. Lefkowitz can be reached on 571-272-2180. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Reena Aurora